# P13B-2124: Changes on Titan's surface

ABSTRACT

**Monday, 14 December 2015**
**13:40 - 18:00**
*Moscone South - Poster Hall*

Cassini's Visual and Infrared Mapping Spectrometer (VIMS) and the Titan Radar Mapper have investigated Titan's surface since 2004, unveiling a complex, dynamic and Earth-like surface. Understanding the distribution and interplay of geologic processes is important for constraining models of its interior, surface-atmospheric interactions, and climate evolution. We focus on understanding the origin of the major geomorphological units identified by Lopes et al. (2010, 2015) [1,2], Malaska et al. (2015) [3] and regions we studied in Solomonidou et al. (2014; 2015) [4,5]. Here, we investigate the nature of: Undifferentiated Plains, Hummocky/Mountainous terrains, candidate cryovolcanic sites, Labyrinth, and Dunes in terms of surface albedo behavior and spectral evolution with time to identify possible changes. Using a radiative transfer code, we find that temporal variations of surface albedo occur for some areas. Tui Regio and Sotra Patera, both candidate cryovolcanic regions, change with time, becoming darker and brighter respectively in surface albedo. In contrast, we find that the Undifferentiated Plains and the suggested evaporitic areas [6] in the equatorial regions do not present any significant changes. We are able to report the differences and similarities among the various regions and provide constraints on their chemical composition and specific processes of origin. Our results support the hypothesis that both endogenic and exogenic processes have played important roles in shaping Titan's geologic evolution. Such a variety of geologic processes and their relationship to the methane cycle make Titan important for astrobiology and habitability studies and particularly significant in solar system studies.

[1] Lopes, R.M.C., et al.: Icarus, 205, 540-588, 2010; [2] Lopes, R.M.C., et al.: JGR, 118, 416-435, 2013; [3] Malaska, M., et al : Icarus, submitted, 2015;[4] Solomonidou et al.: JGR, 119, 1729-1747, 2014; [5] Solomonidou, A., et al.: In press, 2015; [6] Barnes, J., et al.: Planetary Science, 2,1, 2013.

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